

### **DETAILED ACTION**

The amendment filed by Applicant on December 28, 2009 has been acknowledged. Claims 30-38, 42, 43, 46-57 remain pending. Applicant amended claims 30, 49 and 56.

The amendment to the Drawings filed by Applicant has been acknowledged. Consequently, the objection to the drawings cited in the previous Office action has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **30-34, 37, 38, 42, 43, 46-53, 56 and 57** are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke et al. (US 5,622,868) in view of Schwabacher et al. (US 7,244,572 B1) and (Percin et al. US 2003/0005771 A1).

Clarke et al. disclose an analytical device 70 (see Fig. 5). The device comprises a test chamber having entrance 72 for accommodating a cartridge 50. The cartridge 50 comprises a pyroelectric transducer 10 covered by a pair of electrodes 12 and 14 (see Fig. 1). Reagents 62 (e.g. antibodies labeled with dyes, see lines 42-52, col. 4) are adsorbed onto electrode layer 12 wherein each reagent is configured to react with a different antigen of interest. Upon reacting with the antigen of interest, the reagent undergoes a colorimetric change. When the reagent/antigen complex is illuminated by pulses of light (see lines 35-40, col. 2), a detectable signal is produced which is relayed to a processor (see Abstract). The signal is indicative of the identity as well as the

Art Unit: 1797

concentration of the antigen (see lines 5-6, col. 9). The device disclosed by Clarke et al. differs from the claimed invention in that Clarke et al. do not disclose that the processor is adapted to measure the delay from the time a pulse of radiation from the light source is generated and a signal from the reagent is detected. In addition, Clarke et al. do not disclose wells for holding liquids.

With respect to the time delay, Schwabacher et al. disclose an analyzer comprising an array of different probes supported on a substrate. Each probe in the array is configured to react with a specific labeled analyte that generates a signal upon excitation by a light source. The analyzer is configured to measure the time delay between the excitation and the detection of a signal to determine the location of the signal source. The signal location is then used to identify the analyte. In light of the disclosure of Schwabacher et al. and given that the device disclosed by Clarke et al. utilizes an array of reagents, it would have been obvious to one of ordinary skill in the art to enable the processor disclosed by Clarke et al. to determine the location of the signal source by measuring the delay between the generation of the excitation source and the detection of a signal. The modification would obviate the need to provide a separate transducer for each reagent (see lines 23-28, col. 6 and Fig. 10).

With respect to the wells, Percin et al. disclose a sensor array utilizing a transducer to measure the characteristics of a fluid sample (see Abstract). The sensor array utilizes wells to accommodate fluid samples (see Fig. 1). In light of the disclosure of Percin et al., it would have been obvious to one of ordinary skill in the art to provide

Art Unit: 1797

grooves/wells on the surface of the cartridge disclosed by Clarke et al. for accommodating liquid samples.

With respect to claims 37 and 38, limitation directed towards the time delay only limits the claimed invention so far as to specify the ability of the claimed invention to measure the claimed time delays. That said, it appears that the processor disclosed by Schwabacher et al. is capable of measuring delay having the claimed temporal ranges. The reference discloses that the analyzer is capable of processing a delay as short as 17 microseconds (see lines 28-30, col. 13).

With respect to claims 48 and 57, given that the processor disclosed by Schwabacher et al. is capable of processing a new signal every 17 microseconds, it would have been obvious to one of ordinary skill in the art to enable the light source disclosed by Clarke et al. to generate a pulse at a frequency of at least 2 Hz to optimize efficiency.

Claims **35, 36, 54 and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke et al. in view of Schwabacher et al. and Percin et al. as applied to claims 30-34, 37, 38, 42, 43, 46-53, 56 and 57, and further in view of Charych et al. (US 6,306,598 B1).

Although Clarke et al. disclose the use of various reagents, the reference does not disclose the use of avidin, biotin or nucleic acid sequences as reagents.

Charych et al. disclose a colorimetric-based analyzer for assaying nucleic acid sequences present in a sample. The analyzer comprises a substrate on which nucleic

Art Unit: 1797

acid sequences are immobilized. The immobilized nucleic acid sequences are intended to bind complementary nucleic acid sequences. Upon binding, a colorimetric change occurs, enabling detection (see line 11, col. 21). The reference also discloses the use of avidin/biotin conjugate to bind an analyte of interest (see line 31, col. 9). In light of the disclosure of Charych et al., it would have been obvious to one of ordinary skill in the art to use nucleic acid sequences as the reagent in the modified Clarke et al. device so that nucleic acids can be assayed. Likewise, it would have been obvious to one of ordinary skill in the art to utilize biotin/avidin conjugate to bind an analyte of interest.

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been fully considered but they are not persuasive.

Applicant's clarification of the invention is appreciated. However, Applicant's argument that the claims are patentable because the claimed invention's purpose for measuring the time delay differs from the purpose disclosed by the cited prior art is not persuasive. The fact that Applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, the suggestion of the prior art refers to measuring the time delay between the time a pulse of irradiation is emitted for inducing an optical change in a sample and the detection of the optical change exhibited by the sample.

Art Unit: 1797

Applicant also argues that the amendment, which specifies the maximum time delay that the invention is allowed to permit (150 milliseconds), overcomes the disclosure of the prior art. This argument is not persuasive because Schwabacher et al. disclose that the analyzer is capable of processing a delay as short as 17 microseconds (see lines 28-30, col. 13). The Examiner acknowledges that the invention disclosed by Schwabacher et al. conveys signals via an optical fiber, which is capable of conveying signals much faster than the invention disclosed by Clarke et al. However, given that the claims recite a time limit that is much slower than 17 microseconds, the Examiner maintains the position that the Clarke et al. sensor can be modified in accordance to the teachings of Schwabacher et al. such that the invention disclosed by Clarke et al. can process the claimed time delay without being rendered inoperable.

Lastly, Applicant argues that there is no motivation to combine the teachings of Clarke et al. and Schwabacher et al. because the disclosure of Schwabacher et al. is directed towards the technical field of optical fibers. This argument is not persuasive because the teachings of Schwabacher et al. relied upon in the rejection is applicable to all similar analytical devices that utilize a light source to irradiate a sample and detect a signal induced by the irradiation.

For the foregoing reasons, Applicant's arguments that the claims are patentable over the cited references are not persuasive.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 1797

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL S. HYUN whose telephone number is (571)272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul S Hyun/  
Examiner, Art Unit 1797

/Jill Warden/  
Supervisory Patent Examiner, Art Unit 1797